Chapter 93
Multiple Multimodal Mobile Devices:
Lessons Learned from Engineering Lifelog Solutions

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ABSTRACT

For lifelogging, or the recording of one's life history through digital means, to be successful, a range of separate multimodal mobile devices must be employed. These include smartphones such as the N95, the Microsoft SenseCam – a wearable passive photo capture device, or wearable biometric devices. Each collects a facet of the bigger picture, through, for example, personal digital photos, mobile messages and documents access history, but unfortunately, they operate independently and unaware of each other. This creates significant challenges for the practical application of these devices, the use and integration of their data and their operation by a user. In this chapter, authors discuss the software engineering challenges and their implications for individuals working on integration of data from multiple ubiquitous mobile devices drawing on experiences working with such technology over the past several years for the development of integrated personal lifelogs. The chapter serves as an engineering guide to those considering working in the domain of lifelogging and more generally to those working with multiple multimodal devices and integration of their data.

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INTRODUCTION

This chapter discusses the role and use of multiple mobile devices in life capture or 'lifelogging'. Lifelogging technologies afford us the potential to record a digital account of our personal life histories. A lifelog collection seeks to collect as much digital data on the activities and life of an individual as possible. Through a range of mobile technologies, not only can the digital content encountered in our day-to-day activities be preserved, but also an individual's current contextual factors determined, for example, through environmental- or personal- sensing. The digital artifacts of significance to us are thereby automatically and passively assembled into a multimodal collection. Such a collection might for instance include emails sent and received, text messages, web pages or documents reviewed or created, photos and videos, along with contextual factors such as places visited or people encountered. By bringing these mobile devices and software solutions, and the data they amass, into confluences, we can gain huge insight into the user and empower life capture and the potential for subsequent retrieval, sharing and reminiscence. Lifelog capture, however, poses software engineering and design challenges, not only in the actual collection and recording of life data, but also in the requirements for data management, data processing, integration and consolidation.

For over two years we have been actively working with large scale multimodal lifelogs created from a range of content and context sources by using a diverse range of applications, platforms and devices. From our experience of working with these capture technologies and in developing software solutions to collect, manage and access these collections, we are painfully aware of the challenges raised when attempting to acquire, assemble, aggregate, and use the information from the range of sources required to deliver interesting content, and relevant understanding about the collection owner. From our practical experiences, we have first-hand knowledge of the difficulties in enabling, using, managing and collecting from the multiple sources used to compile a lifelog. From working with these mobile devices we have also gained invaluable insights into bringing them into confluence. The challenges posed by our activities have implications on engineering the design and creation of software solutions to enable lifelogging and lifelogging applications, and on applications dependent on multiple multimodal devices in general. This chapter is intended to serve as a practical tool for those seeking to gather and use information compiled from diverse mobile devices.

BACKGROUND

In his seminal work Vannevar Bush (Bush, 1945) conceived the notion of lifelogging as a device on which all a person's personal information could be stored and from which it could then later be retrieved. Towards realizing this vision, Microsoft's Gordon Bell (Bell, 2001) has invested both effort and time in the archival and digital capture of all of his personal data. His efforts and the initial focus for lifelogging technology emphasized desktop retrieval, e.g. (Dumais et al., 2003), however in more recent years equal importance has been placed on mobile access and capture (Mase et al., 2006). These technologies, and indeed the wealth of personal information they capture through mobile devices has been explored and exploited not just for personal use but across a range of domains. These have been outlined by Byrne et al (2008b), and include for example therapeutic and medical solutions (Berry et al., 2007; Hodges et al., 2006; Al Mahmud et al., 2008), the obvious use in reminiscence (McCarthy et al., 2007) and more diverse and playful applications (Wood et al 2004).

Recently much attention has been given to lifelogging and research has focused on addressing many of the challenges presented in the manage-